Section 3:   Math and Science

This section addresses Math and Science standards. These two
content areas are grouped together as there is overlap of the
knowledge and skills. This section correlates with the
Kindergarten Curriculum Standards in Math and Science.

Math and Science 0-4 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Problem Solving and Spatial Sense	Pays attention to what is happening in the environment.	Looks at and reaches for toys.	
				Shows excitement when seeing caregiver.	
			Aware of surroundings; makes things happen, most often unintentionally.	Gazes at own hands as they move about ; waves arms to touch the dangling toy overhead.	
	Science	Observation	Shows interest in surroundings by focusing on faces and objects in close range.	Looks at surroundings in a new place.	
				Explores objects placed in hands; brings objects to mouth; uses entire body to reach toward a toy	

Math and Science 4-8 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem Solving and Spatial Sense**	Displays short term memory	Reaches toward objects and move the object or themselves to mouth or touch it	
				Turns head away when adult reaches out a wash cloth to wipe face	
				Looks for familiar person after she has left the room	
				Looks toward sky when an airplane is heard overhead	
			Makes things happen	Drops toy and looks for it; pulls a string attached to a toy making it come closer and closer	
	Science	**Sensory Awareness**	Attends to what is happening in the environment	Feels and explores objects	
				Bangs a block on the floor repeatedly, to hear the sound that it makes	
				Purposely pushes buttons on toy box, although sometimes still surprised at the results	
				Repeatedly turns an object over and listens to the sound the movement makes	

DOMAIN	Area of Learning	Components	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem solving and Spatial Sense**	Makes things happen through use of senses of sight, sound, taste, and touch	Begins to enjoy putting items in and getting items out of something	
				Explores and inspects the smallest details and objects (i.e. breadcrumbs, ants)	
				Searches for items that have been covered, placed inside something, or removed	
				Enjoys pulling things off shelves, out of cabinets, or baskets	
				Drops toy from high chair and waits for someone to pick it up	
				Tries to complete form board, pushing and pounding with determination	
	Science	**Observation and exploration**	Shows understanding of things in the environment during exploration	Opens certain drawers where they know there are toys	
				Points to familiar pictures in books	
				Pushes buttons on toy box waiting for clown to pop up	
				Begins to imitate familiar motions such as stirring	

Math and Science 12-18 months

DOMAIN	Area of Learning	Components	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem solving and Spatial Sense**	Begins to explore physical properties of objects and to identify their use.	Attempts to imitate familiar actions of adults-puts key in key hole, turns screwdriver	
				Stacks and then knocks down towers and stacks them up again	
				Places circle and square in form board	
				Explores small openings and looks for items to put in the opening, including fingers	
	Science	**Observation and Exploration**	Uses all five senses to explore and understand surroundings.	Begins to connect familiar activities with actions or pictures in books or magazines. Builds on understanding while exploring the environment	
				Begins to mix, fill, and dump materials in containers	
				Pats, pushes, squishes and pounds play dough to experience how it feels	

Math and Science 18-24 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Problem solving**	Begins to group objects by their function	Participates in dramatic play acting out familiar actions, feeding baby, cooking and eating	
			Begins to recognize objects as the same and different	Separates objects by single feature (color)	
				Begins to match simple geometric forms such as circle, square, and triangle.	
		Numbers	Begins to use number words in songs and finger plays with little or no understanding	Participates in singing songs and fingerplays that refer to counting or numbers (5 little monkeys, etc)	
			Begins to build understanding of more	Asks for "more"	
		Spatial Sense to develop understanding of conservation, geometry and numbers	Explores their world and begins to understand their position in space and how to get around	Fills and dumps a variety of containers with different materials	
				Moves through obstacle course going over, under, through, around, in and out.	
				Explores new ways to make things go together, legos, puzzles, shape toys, peg boards, etc	

Math and Science 18-24 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Building knowledge of the child in relation to the world around him**	Expects specific results when playing with toys and other object	Builds with a variety of objects and begins to understand about balance, size and weight	
		Building knowledge of the world through observation of surroundings	Shows increased knowledge and memory for details and routines	Building awareness of other people, places, and events.	
				Participates in dramatic play acting out familiar actions, feeding baby, cooking and eating	
				Goes to sink to wash hands when called for lunch or snack	

Math and Science 24-30 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Numbers	Begins to build understanding of more, and one to one correspondence	Responds to one and one more. Begins to count by imitation	
		Patterns	Begins to understand the relationship between objects, solving simple jigsaw puzzles and matching similar shapes.	Begins to identify simple objects by their use, color and shape	
				Correctly stacks nesting cups, completes simple inset puzzles, and completes stacking ring in correct order through trial and error	
		Spatial Sense	Matches circle, square and triangle shapes	Uses trial and error to complete circle, triangle, square form board	
			Explores world and understands position in space and how to get around	Understands how to climb up, go around, in, or through various spaces to get to or to reach an out of reach object	
		Problem solving	Explores materials and understands simple acts of cause and effect	Begins to build simple block designs through trial and error	

Math and Science 24-30 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Observation	Begins to build knowledge of the world through observation of surroundings.	Explores ways to do things and demonstrates beginning understanding of concepts of color, shape size, matching, and weight	
		Sequencing and Time	Begins to understand consequences when re-creating events	Calls for adult to help settle a fight over a toy	
				Insists on putting on mittens before putting on coat	
			Demonstrates some understanding of when things happen in relation to routines.	Imitates simple block structures and single-line crayon strokes	
				Chooses new shoes to wear when getting ready for special occasion	
		Problem solving	Begins to use reasoning skills and imagination when planning ways to make things happen.	Combines toys in complex ways to represent real objects such as using play dough in the dramatic play area to represent food	
				Looks outside at the newly fallen snow and runs to get on boots and mittens	
				Makes up stories when building with unit blocks, or while coloring	
				Begins to act out familiar stories	

Math and Science 30-36 months

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Numbers	Continues to build understanding of quantity and size	Makes requests for "more" in a variety of situations; begins to compare size by using words such as big, little, small	
			Begins to count by rote	Participates in songs and finger plays involving counting	
		Patterns	Continues to understand the relationship between objects, solving simple jigsaw puzzles and matching similar shapes	Completes 3-4 piece puzzles	
				Begins to point out the differences in objects rather than the similarities	
				Matches more complex shapes such as hexagon, trapezoid, etc	
		Spatial Sense	Explores world and understands position in space and how to get around	Responds with accuracy most of the time when asked to put the blocks "on" the table, or to go "under" the table	
		Problem solving	Explores materials and understands simple acts of cause and effect	Builds simple block designs with some understanding of larger, heavier blocks go on the bottom and smaller light weight blocks go on top	

Math and Science (30-36 months)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Observation**	Builds knowledge of the world through observation and awareness of surroundings.	Shows curiousity and asks questions about the environment is more interested in trial and error	
		Sequencing and Time	Begins to understand consequences when re-creating events	Understands the need for a coat for warmth when it is cold outside	
			Demonstrates some understanding of when things happen in relation to routines.	Begins to make connection between daily events and what happens "next" (after lunch it is time for a nap)	
		Problem solving	Uses reasoning skills and imagination when planning ways to make things happen.	Describes drawing made after trip to the fire station	
				During dramatic play, encourages peer to blow on food that is "hot"	

Math and Science 36-48 months (3 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Number and operations	Begins to identify and label objects using numbers	Counts a collection of 1-4 items and begins to understand that the last counting word tells how many	
				Can quickly "see" and label a group of objects of one to three with a number	
				Begins to make use of one-to-one correspondence in counting objects and matching groups of objects	
		Patterns and Algebra	Explores and begins to sort and classify objects	Begins to sort objects on the basis of one dimension, color, size, shape	
			Begins to identify, describe, and extend patterns	Begins to recognize, duplicate and create patterns	
				Begins to place objects in order through trial and error	
		Measurement	Begins to demonstrate understanding of time, length, weight,capacity and temperature.	Recognizes and labels measurable characteristics of objects (e.g. I need the long string.)	
				Uses approximate measures of familiar objects using nonconventional measuring tools	
				Begins to use conventional measurement terms (mile, age span, month, cup,etc) without accuracy	
				Understands time as a sequence of events that relates to their daily lives	

Math and Science 36-48 months (3 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	Geometry and Spatial Sense	Becomes aware of their bodies and personal space during active exploration of physical environment	Begins to build mental and physical maps of their surroundings.	
				Responds to "Put it beside" "Put it under".	
				Explores geometric shapes using their hands, eyes and mind.	
			Begins to explore the size, shape, and spatial arrangement of real objects.	Notices and copies simple repeating patterns, such as a wall of blocks with long, short, long, short,….	
				Begins to notice different shapes and identifies big and small shapes	
		Problem solving and analyzing data	Begins to develop foundation for linking concepts and procedures with active experiences	Sorts objects and counts and compares the groups formed	
				Builds simple structures with blocks	

Math and Science 36-48 months (3 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Life Science	Observes surroundings in relation to knowledge and methods about life science	Understands new information and begins to explore more complex situations and concepts	
				Expands knowledge of and respect for their body and the environment	
				Expands knowledge of and abilities to observe, describe, and discuss the natural world, materials, living things, and natural processes	
		Earth and Space Science	Sequencing and time in relation to knowledge and methods about Earth and space	Understands the sequence of daily events.	
				Demonstrates some understanding of duration of time, "all day", "for two days"	
		Physical Science	Problem solving in relation to knowledge and methods about energy	Begins to participate in simple investigations to test observations, discuss and draw conclusions, and form generalizations	K11, K12, K14
				Thinks about a problem and figures out what to do	K11, K12, K14

Math and Science 48-60 months (4 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Number and Operations**	Begins to identify and label objects using numbers	Develops increased abilities to combine, separate and name "how many" concrete objects	K.1.1
			Devleops understanding of numbers and their association with objects.	Begins to associate number concepts, vocabulary, quantities, and numerals in meaningful ways	K.1.2
				Develops increasing ability to count in sequence to 10 and beyond	K1.1
		Patterns and Algebra	Explores and begins to sort and classify objects	Shows understanding of and uses comparative words	K.1.3
				Groups common related objects : shoe, sock, foot: apple, orange, plum	
			Identifies, describes, and extends patterns	Copies repeating patterns and begins to construct own patterns	K.4.2
		Measurement	Begins to demonstrate understanding of time, length, weight,capacity and temperature	Constructs a sense of time as it relates to their daily lives	K.4.1
				Participates in measuring activities using conventional and nonconventional measuring tools	K.2.1
				Uses conventional measurement, time, and money terms with some accuracy	

Math and Science 48-60 months (4 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Math	**Spatial sense and geometry**	Becomes aware of personal space during active exploration of physical environment	Builds an increasing understanding of directionality, order, and positions of objects, and words such as up, down, over, under, top, bottom, inside, out-side, in front, and behind	K.3.2
			Explores and recognizes the size, shape, and spatial arrangement of real objects	Identifies and labels several shapes. (circle, square, triangle, rectangle)	K.3.1
		Problem solving and analyzing data	Begins to develop foundation for linking concepts and procedures with active experiences	Demonstrates increasing interest and awareness of numbers and counting as a means for solving problems and determining quantity	K.1.3

Math and Science 48-60 months (4 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	**Life Science**	Recognize that living things are made up of parts.	Begins to make comparisons among living things such as flowers, insects and animals.	K.1.1
			Recognize that people use their 5 senses to explore their environment.	Expands knowledge of and abilities to observe, describe and discuss the natural world, materials, living things and natural processes.	K.2.2
			Recognize that living things live in different environments.	Expands knowledge of and respect for their body and the environment.	K.5.2
		Earth and Space Science	Recognize the concept of day and night.	Continues to asks questions about the natural world and seeks answers through active exploration.	K.7.1
			Recognize daily weather conditions.		K.8.1
			Recognize that time and temperature can be measured with a clock and thermometer.		K.8.2
			Recognizes a variety of earth materials by their observable properties. (rocks, sand, dirt).	Begins to use senses and a variety of tools and simple measuring devices to gather information, investigate materials and observe processes and relationships.	K.10.1
			Classify materials by their elements.	Develops increasing abilities to classify, compare and contrast objects, events and experiences.	K.10.2

Math and Science 48-60 months (4 years)

DOMAIN	Area of Learning	Component	Learning Expectations (examples)	Performance Indicators (examples) By the end of age span	Correlations
COGNITIVE DEVELOPMENT	Science	Physical Science	Recognize the basic concept that forces can move objects.	Begins to participate in simple investigations to test observations, discuss and draw conclusions and form generalizations.	K.11.1
			Recognize that objects have observable properties that can change over time and under different conditions.	Develops growing abilities to collect, describe and record information through a variety of means, including discussion, drawing, maps and charts.	K.12.1
			Recognize that the sun gives us light.	Begins to describe and discuss predictions, explanations and generalizations based on past experiences.	K.14.1
			Recognize that sound is produced when two objects collide.	Uses senses to observe and explore classroom materials and natural phenomena.	K.14.2